**Difference Between JPA, Hibernate, and Spring Data JPA**

#### **Java Persistence API (JPA)**

* JPA is a **Java specification** for accessing, persisting, and managing data between Java objects and a relational database.
* It is **only an interface**, meaning it provides a set of rules (APIs), but not the actual code to perform operations.
* It defines concepts like Entity, EntityManager, and annotations such as @Entity, @Id, etc.
* JPA is implemented by tools like Hibernate.

#### **Hibernate**

* Hibernate is an **ORM (Object-Relational Mapping) framework** and one of the most popular **implementations of JPA**.
* It provides the actual code (logic) to map Java objects to database tables and handle database operations.
* It includes both **JPA-compliant features** and additional **non-standard features** (caching and performance optimizations).
* Developers must manually manage sessions and transactions if not using Spring.

#### **Spring Data JPA**

* Spring Data JPA is a **part of the Spring Framework** that builds on top of JPA.
* It does **not implement JPA**, but provides an abstraction that reduces the need for writing boilerplate code.
* With Spring Data JPA, you can create **repository interfaces** instead of writing your own queries.
* It integrates smoothly with Spring Boot and manages transactions automatically.

### **Code Comparison**

#### **Hibernate**

public Integer addEmployee(Employee employee){

Session session = factory.openSession();

Transaction tx = null;

Integer employeeID = null;

try {

tx = session.beginTransaction();

employeeID = (Integer) session.save(employee);

tx.commit();

} catch (Exception e) {

if (tx != null) tx.rollback();

} finally {

session.close();

}

return employeeID;

}

#### **Spring Data JPA**

**Employee Repository**

public interface EmployeeRepository extends JpaRepository<Employee, Integer> {

}

**Employee Service**

@Autowired

private EmployeeRepository employeeRepository;

@Transactional

public void addEmployee(Employee employee) {

employeeRepository.save(employee);

}